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UPPER CLOSING ILLUSTRATED.

A TREATISE FOR THE USE OF MACHINE-ROOM MANAGERS AND TECHNICAL STUDENTS.

WITH REFERENCES TO

Sewing Machines; Skiving Machines; the Holding-together System; Needles; Stitching Materials; and General Management of the Closing Department.

By W. W. KILWORTH.

ONE SHILLING.

LONDON:
THE BURLINGTON PUBLISHING COMPANY, LIMITED,
72 to 77 Temple Chambers, London, E.C.

Upper Closing Illustrated

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PREFACE.

THE remarks contained in this booklet are a modest attempt to set down in plain language an explanation of some of the many operations in the closing of boot and shoe uppers as performed in most British manufactories at the present day.

As they are chiefly intended for the assistance of students attending the technical classes connected with the boot and shoe industry, I have, as far as possible, tried to point out by means of illustrations, marked with indication "arrows," the various parts of machines described, believing that the eye, if directed to a particular object, will convey a more complete idea of what is meant than a mere repetition of the technical terms employed by mechanics.

The matter first appeared as serial articles in the BOOT AND SHOE TRADES JOURNAL, and it was thought advisable to reprint it in the more permanent book form in which it now appears.

That the subject has been somewhat briefly dealt with is admitted, but I wished to avoid anything like a ponderous, weighty, or "dry-as-dust" form, aiming rather at a lighter style, which it should not be an infliction to be obliged to study.

And, further, the articles had to be written during successive winter evenings, after the day's work and worries which naturally accompany the management of a large closing department.

Written, too, after more than thirty years' strenuous toil in some of the best-known centres of the trade, whatever little knowledge I have gained and now try to impart to others is the outcome of daily practical experience.

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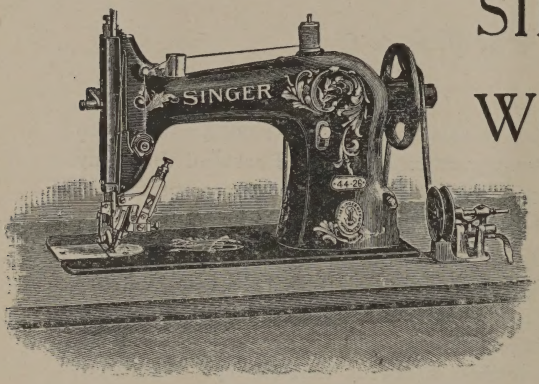

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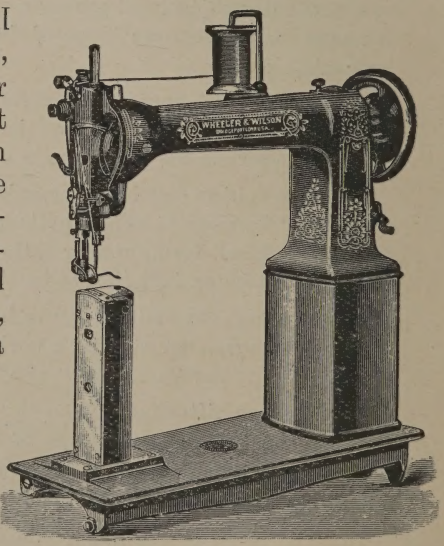

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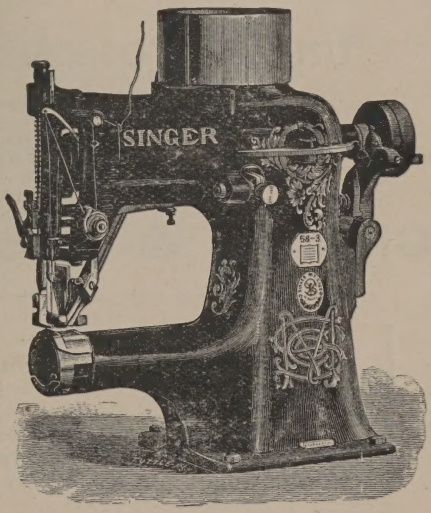

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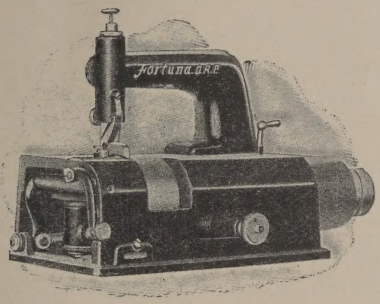

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Upper Closing Illustrated.

Upper closing is, perhaps, the one subject in connection with the manufacture of boots and shoes about which comparatively little has been written. It is true that most of the standard works contain a chapter or so dealing with the matter; but, apart from those, it is not often that contributions on the subject appear in the trade papers.

It is not very difficult, perhaps, to give a reason for this, as the subject is by no means easy to deal with, and is not one which lends itself easily to a clear and intelligent definition of processes, either by a written description or by the aid of sketches. Then, again, the different methods which are followed in various towns (and even at separate factories in the same town) to obtain the same results make a writer unwilling to commit himself to any particular method. Further, the great variety of designs produced at the present day makes it almost impossible to construct a standard of rules to be followed in upper closing. Almost every pattern-cutter varies his designs in some of the smaller details, which variation often means adopting some special method in the closing department to suit the particular pattern.

It follows, therefore, that in the present treatise on "Upper Closing Illustrated" the student must not expect to find instructions for the closing of every type of boot manufactured to-day; to attempt such a thing would be useless, especially when we consider that de-

signers are constantly trying to produce something new and attractive—sometimes, perhaps, without due regard to the difficulty of manipulation in the closing-room. It is rather the intention of the writer to try and give, as far as possible, a clear and distinct idea of some of the modern methods of detail employed in the production of a few what we will call standard types of boot and shoe uppers.

It is proposed that our subject shall embrace the whole of the operations in the department under consideration, and we shall therefore have something to say about the various makes of sewing and other machines which are in use at the present time, giving a few details about their construction and hints as to the remedy of minor defects by means of slight adjustments. Stitching materials, such as silks, threads, and cottons, will also be considered, while the small, but very necessary, needle will not be overlooked. In addition, the important matter of management of the department will be included.

It is probably confusing to those outside the trade to find that this branch of manufacture is sometimes re-rerred to as the closing-room, the stitching-room, and the machine-room. The first title is, I think, the oldest and most correct, as the name is, I presume, derived from the old method of closing together the various pieces of the upper by hand, the parts being held firmly in the "clams," which rested against the knees of the worker. The word "stitching-room" is, I think, of American extraction. The definition of machine-room answered very well twenty years ago; but since the introduction of so much machinery into the making and finishing departments it is a little confusing.

As machinery plays such an important part in the up-to-date closing-room, it will, perhaps, be well to give a description of some of the machines in use before proceeding further.

In 1881 a book was published on "Sewing Machinery," which was written by Mr. J. W. Urquhart, C.E., in which a very interesting account appears about the struggles of Elias Howe (who may be considered as the inventor of the sewing machine) and of Allen B. Wilson (the inventor of the rotating hook), before their inventions were appreciated and taken up by the public.

The fierce opposition of the hand closers to the introduction of the sewing machine into the boot trade is of more recent date, but too far back to be remembered by many of those actively engaged in the trade to-day. It was, however, very real and determined for a time;

Fig. 1.

The Lock-stitch.

but the thin end of the wedge of machinery was being inserted, and has ever since been gradually driven in further; and even now the "head" of the wedge does not yet appear to be in sight, though the tendency is certainly in the direction of using machines, wherever possible, for those operations which have previously been performed by hand.

There are several styles of what are usually called plain machines—i.e., machines for ordinary stitching, not being fitted with any extra device, or constructed merely for some special operation. Such machines make an ordinary lock-stitch, as Fig. 1. The "lock" should be in the centre of the leather, and the stitch have a regular appearance, both on the top and under sides. Any irregularity of the tension will easily be observed on examination; that is, if the top thread is too tight it will pull the under thread up on to the surface; or, if the reverse is the case, the top thread will be visible on the inside. It is evident that an uneven

tension has little strength, because it follows that if either of the threads is simply lying on the surface, with the other thread loosely looped over it, then this thread will easily break when subjected to any strain.

The machines making this style of stitch may be the oscillating shuttle, the rotating hook, the vertical hook, or the centre bobbin machine.

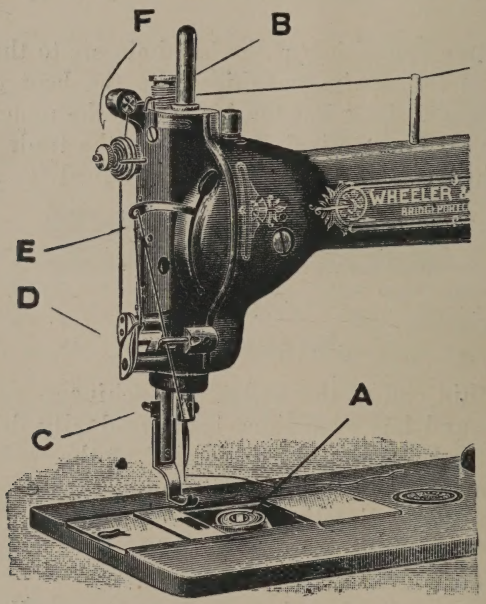

Fig. 2.

Our illustration (Fig. 2) shows one of the vertical hook variety; the plate is pushed back to show the hook, or shuttle (letter A). The name "vertical" is a little confusing, as the hook really revolves on a horizontal plane, but is propelled by a vertical shaft; hence its name. The parts here shown are: A, shuttle; B, needle bar; C, pressure bar; D, check spring; E, check lever or "take-up"; F, top tension.

One of the peculiarities of this machine is that there is no "shuttle-race" in which the shuttle works, but

the shuttle revolves in space. The advantage claimed for this is that the "life" of the shuttle is prolonged, as there is no friction.

Three other well-known makes of shuttles are shown

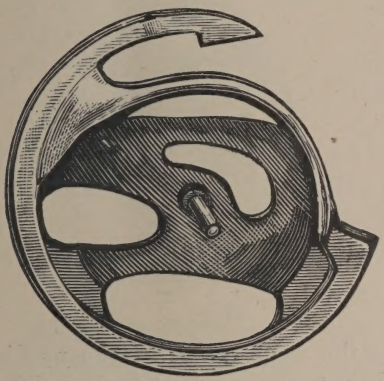

Fig. 3.

in outline in the following sketches:—Fig. 3, the rotating hook; Fig. 4, the oscillating shuttle; Fig. 5, the central bobbin.

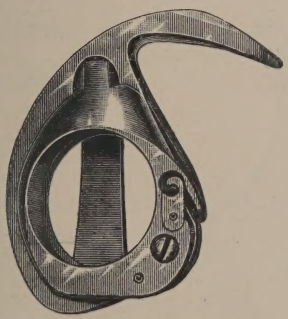

Fig. 4

The student must always remember that the difference in motion between the rotating hook and the oscillating shuttle is as the difference in name—i.e., the former makes a complete circle, and the latter oscillates backwards and forwards. The shuttle known as

the "central bobbin" also has an oscillating movement.

The "feed" of a machine—that is, the mechanism

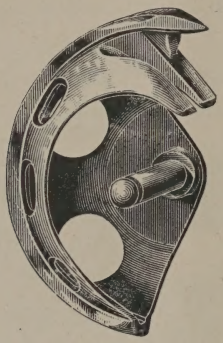

Fig. 5.

which moves the work along as the needle stitches—may be a drop-feed or wheel-feed. The former is

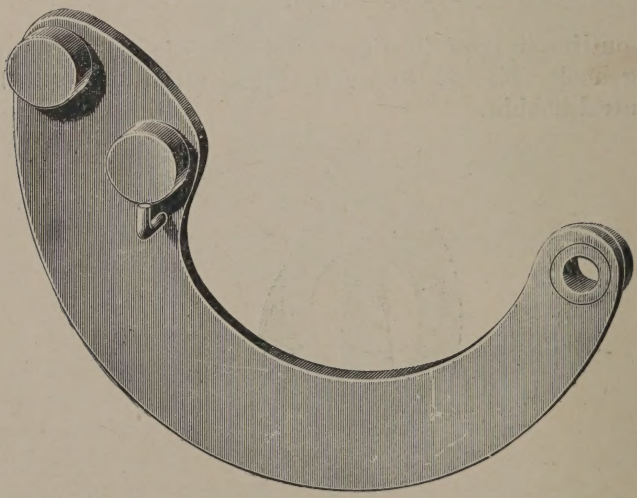

Fig. 6.

known as a four-motion feed; it first rises and presses into the material, then carries the work forward, falls, and moves backward.

The wheel-feed is, as its name implies, simply a wheel with a serrated edge, which revolves continuously in one direction, carrying the work forward. This wheel is propelled by a "driver," which grips the inner edge of the wheel, and pushes—or pulls—it a short distance, then releases it, and returns to its former position, ready for another similar movement.

There is a slight difference in detail in some of the "drivers." The one shown in Fig. 6 has two round studs, between which the wheel passes. Personally, I prefer these round studs to some of the other makes, because when they become worn flat on the inner sides it is an easy matter to knock them out with a punch and

Fig. 7.

turn them round, which makes the driver do its work as well as when new.

Many operators make a mistake in oiling this feed-wheel. As the driver has to grip the wheel and push it round, it is a serious and stupid blunder to make the surface slippery by smearing it with oil.

I should state that the wheel is kept from going backwards (when released by the driver) by means of a "clutch" (Fig. 7).

Before proceeding to the consideration of machines designed for special operations, or ordinary machines with special attachments, it would, perhaps, be well to set forth some few of the difficulties which are of such frequent occurrence where a large number of sewing machines are in operation. I shall only attempt to give an idea of what may be considered as minor troubles, which can usually be overcome by slight adjustments. There are, of course, at times, defects which require a

skilled mechanic to put right; such matters do not come within the scope of this work.

A very common fault is that of missing stitches; for some reason or other the shuttle fails to catch the loop, which the needle should throw out as soon as it commences to rise; the result is that the threads—the upper and lower—are not "locked," so that a perfect stitch is not formed. Some operators, when this occurs, will say that their machine "skips," others that it "slips,"

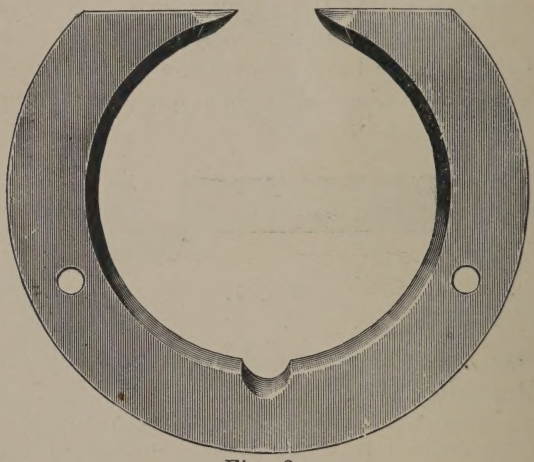

Fig. 8.

or it "misses," or it does not "pick up"—all of which terms refer to the same defect.

The first thing to be examined should be the shuttle. Look carefully at the point; it may be that a very small piece is broken off the end of the point, or the point is worn away until it is a fraction of an inch shorter than when it was made. If this is so, it becomes "out of time," i.e., it fails to come round quick enough to catch the loop thrown by the needle. Practically the only remedy in such a case is a new shuttle, if of the rotating-hook or centre-bobbin type, or a new half may suffice, if of the oscillating variety, as this shuttle is made in two separate halves. There are cases, how-

ever, where the shuttle carrier is secured to the shaft by means of set-screws, instead of being "pinned." It is then possible to put the shuttle "in time" again by moving it slightly forward, but skill and care are required, or the result will not be obtained.

Supposing the shuttle to be in good order, then the defect must be looked for in some other direction. Glance at the needle, and see if the operator has set it correctly—needles have to be set differently for different types of machines. In most modern "plain" machines the needle has to be put as high as the shank will allow it into the needle-bar, and the long groove to the left hand. If it appears correct, remove the throat-plate, so as to get a full view of the needle and shuttle when their points meet and the loop is formed. Now turn the balance-wheel at the top of the machine very slowly with the right hand, holding the top thread, which has passed through the needle eye, with the left, and noting carefully if the shuttle misses the loop because the needle has already risen too high. If so, it is possible that the needle-bar may have moved slightly out of its proper place. This must be adjusted by loosing the set-screw, and lowering the bar until it is in proper position.

Even after this somewhat lengthy description one is conscious that it is probable the thing will not be quite clear, for, as is often the case, much more may be taught in a few minutes by a practical demonstration than by many written phrases.

The frequent breaking of needles is another troublesome—and expensive—fault, causing much annoyance. Here, again, it is the shuttle that needs first to be examined. Moving as it does at a very high rate of speed in the shuttle-race, it follows that there is a good deal of friction, and, if the parts are not properly lubricated, either the race or the shuttle will soon show signs of wear, which gives too much lateral "play" to the shuttle, with the result that occasionally the needle gets

on the wrong side of the shuttle, which, naturally, breaks the needle. A self-lubricating shuttle would be a boon to users of machines, and I fail to see it could not be accomplished with exceedingly little trouble.

There are many styles of races, which vary slightly in detail. If the one under examination has what is known as a flat ring (as Fig. 8), the defect may sometimes be remedied by slightly filing it on the under

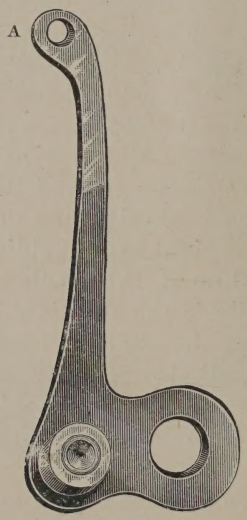

Fig. 9.

side, so as to take out the hollow worn by the shuttle, and give a uniform level surface. If this is not practicable, then a renewal of shuttle will be necessary. Sometimes needles are broken owing to the hole in the throat-plate, through which the needle passes, becoming enlarged by constant wear; this allows the needle to deflect at times, and strike the shuttle.

The breaking of thread may be caused in several ways. It is not often that an operator will screw up the top-tension until it is so tight that the silk will not bear the strain put upon it, but this does sometimes occur.

The remedy is obvious and very simple—loosen the screw a little.

Care should be taken that the needle used is of the proper size to carry the silk: also that there is no roughness in the eye. Next examine the check-lever or "take-up" (Fig. 9), and see if the top hole (letter A) is in good condition, as the silk is very liable to cut a deep nick at this point. This would cause the silk to fray as it passed through, and weaken it considerably, so that it would not bear the strain put upon it. If there should be a nick (but not cut very deep), it can be rubbed out by the aid of fine emery cloth. Should the cut be very deep, there is no remedy but a new lever.

Another frequent cause of thread breaking is that the small roller on the "take-up" (letter B) is worn so as not to fit the cam properly, which causes a jerky movement, or a sudden snatch, of the silk, instead of a more steady pull. A new roller will suffice if this is the cause; but in some cases it is the cam of the machine which has worn unlevel. This means a new cam, and the services of a mechanic.

A very annoying defect is that of looping on the under-side of the material. This may easily escape detection for some time, as the stitch looks all right on the top; but when looked at on the under-side, little loops appear at intervals. Not infrequently this is caused by some roughness or projection on the shuttle, such as the head of the small screw which holds the spring of the under-tension. This can easily be smoothed by the application of emery cloth. Again, the trouble may be caused by the check-spring, which may need adjusting.

These are all small matters, which may readily be remedied when they are found; but the difficulty sometimes is to find them.

Having now dealt briefly with some of the minor "troubles" caused by the plain sewing machine, we

will proceed to consider some of the "specials," the foundations of which are generally constructed on the same lines.

Trimming machines—both vertical and oblique—are

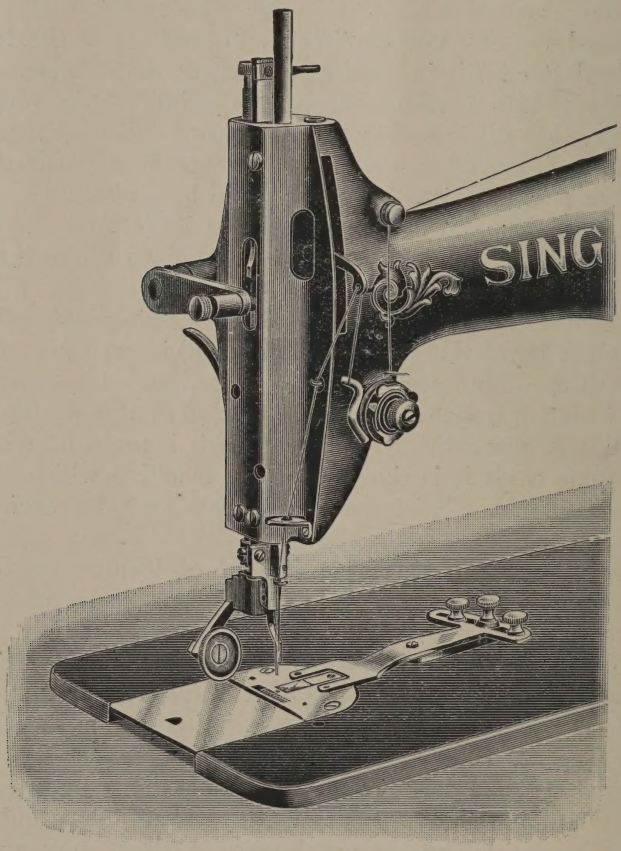

Fig. 10.

so essential to modern methods of upper closing that no machine-room should be without them.

Our illustration, Fig. 10, represents one of the vertical variety. It can be used with much advantage on many classes of work, and many operations can be

performed more satisfactorily and economically by its aid than without it. All raw edge work, such as men's common Bals. with trimmed edges, is much better in appearance if stitched on this machine and trimmed at the same time, than if stitched on an ordinary machine and trimmed afterwards by hand.

Reverse scollop button bits can with advantage be trimmed ready for bagging on this machine, and, in fact, practically all bagged work, such as Oxford shoes, Derby shoes, or Bals. Binding, too, for narrow (or pulled-over) bound work will be much better if the operator runs it on with one of these machines, using

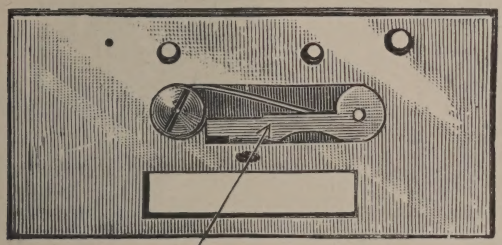

FIG. II.

the knife attachment to trim off the small margin necessary for "catch."

Then, again, all seams are stronger and better if closed on a machine with a trimming attachment than if left to be trimmed by hand, which latter operation is always risky.

One of the things most essential for the proper working of this class of machine is that the knife must be kept in good condition—that is, the cutting portion should always be sharp, so as to make a clean cut; otherwise a rough, ragged edge will be left on the work. There is a special emery wheel sharpener sold, for the sharpening of these knives; but, failing one of these, the edge can easily be rubbed up on an oil-stone, or held for a few minutes on the emery wheel attached to the "Amazeen" skiving machine.

It should also be carefully noted whether the part (letter A) on the throat-plate, Fig. 11, is worn until the face of it is unlevel at the point indicated by the arrow; if so, it should be taken off and refaced, until the edge is quite square where the knife passes.

As all trimming machines have a double amount of work to do—i e., to stitch and to trim—it is necessary

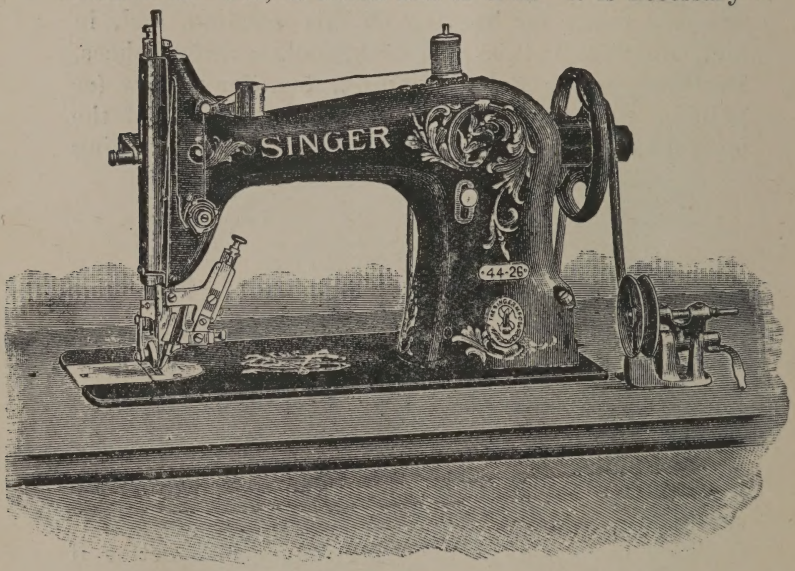

Fig. 12.

that the driving-belt should be fairly tight, so as not to slip on the pulley.

What may be considered as a sister machine to the one just described is the oblique, or diagonal trimmer, Fig. 12. The special feature of this machine is that the oblique position of the knife admits of the under-edge of the lining being trimmed off a slight distance back from the top edge; so that it is very suitable for all work having turned-in outsides and trimmed-off linings, such as Bal. facings, shoe quarters, etc.

This machine can be used with much advantage for

cutting out the centres of all sorts of fancy bar shoes. Fig. 13 shows a design much in use. This shoe can be done much better and far more economically on the machine than by hand.

For the clicker to cut out the centres of the lining after the edges are machined round requires much care and time, and there is always a liability of the knife cutting the stitches at points A and B. This, however, is obviated if trimmed on the machine. One of the most important factors which make for the successful working of the oblique trimmer is a careful and skilful operator.

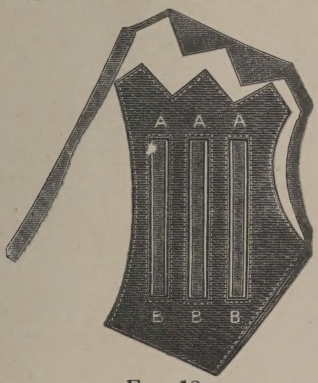

Fig. 13.

It seems almost impossible to imagine a machine-room without a binding machine, and yet it is a somewhat recent invention, and shoes were bound before its inception; but what an amount of time and care had to be bestowed by the fitter on the flat-bound boot or shoe! For binding men's shooting boots with leather, or ladies' Court shoes, or tongues with galloon, the binding machine is indispensable. Fig. 14 shows one of the types in general use. The cylinder with walking foot feed is, perhaps, one of the best styles made for binding purposes.

There are several makes of twin-needle silking machines in use, for stitching back-seams, etc. Some are made on the loop-stitch principle, and make what is

known as the "double chain stitch." This is more especially suitable for light work, such as glace kid; the stitch being somewhat elastic, it will stretch with the leather, and so is better adapted to stand the strain of lasting than if it was more rigid.

For stouter leathers—glove hide, etc.—it is necessary to have the needles rather further apart than in the

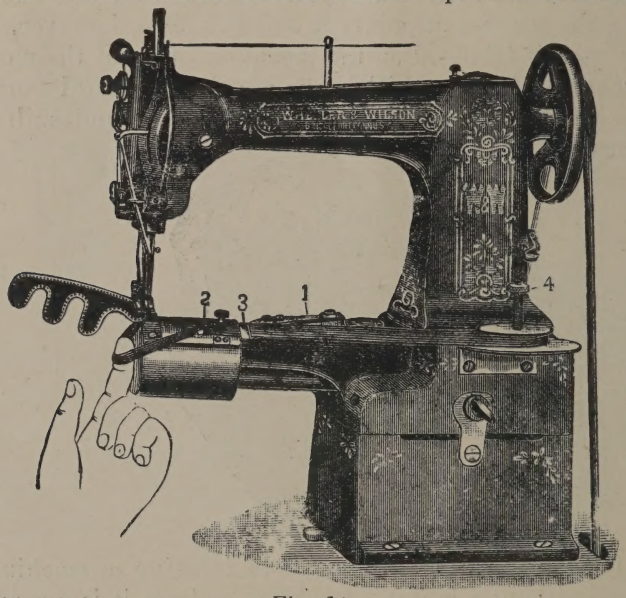

Fig. 14.

case of light work, as the stoutness of the material causes the needles occasionally to deflect slightly, when they are very liable to cut the closing stitch, and so spoil the seam. On this class of work, perhaps, the lock-stitch variety is most suitable.

The two-needle chain-stitch machine (Fig. 15) is well adapted for the tapeing of linings for ladies' work, and being (as its name implies) a loop-stitch, a high speed is obtained. It is necessary that the tape should be exactly the right width to fit the guide, to get the best results. Unfortunately, the tape cannot always be

relied upon to be exact to measure; that which is sold as half-inch is sometimes a fraction under measure, thus

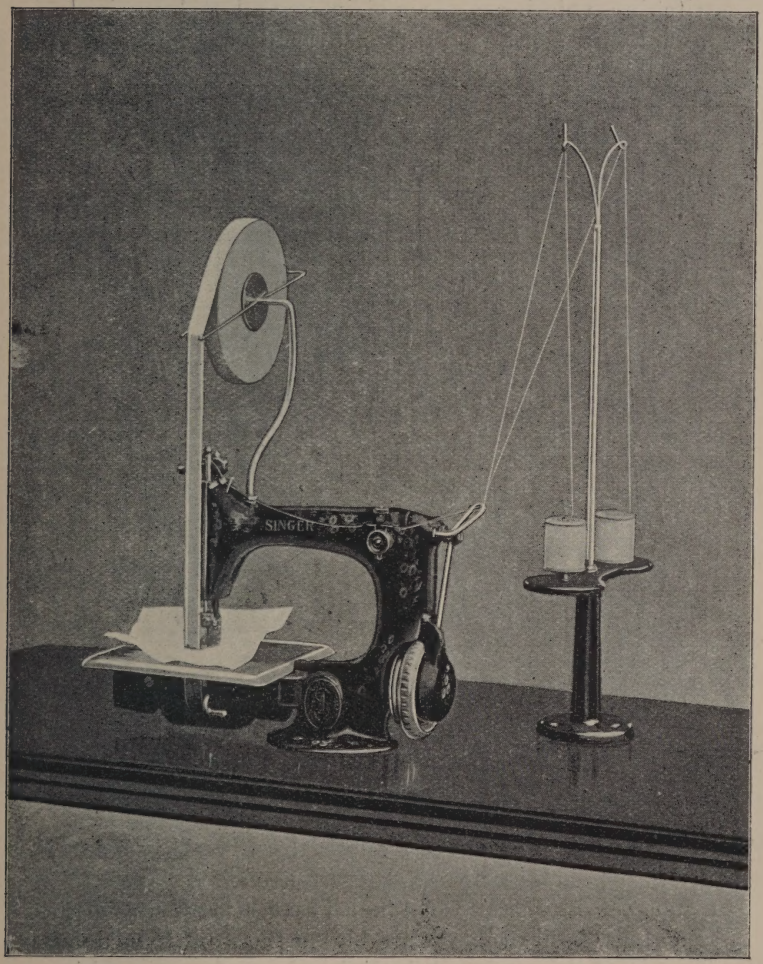

Fig. 15.

causing much trouble, as one of the needles will very probably miss the tape.

Some firms prefer to dispense with tape altogether, and have the linings "French seamed." A special machine is sold for this purpose. Cylinder machines for stitching goloshes are made in several styles—single-needle, twin-needle, left-hands, right-hands, long-arms

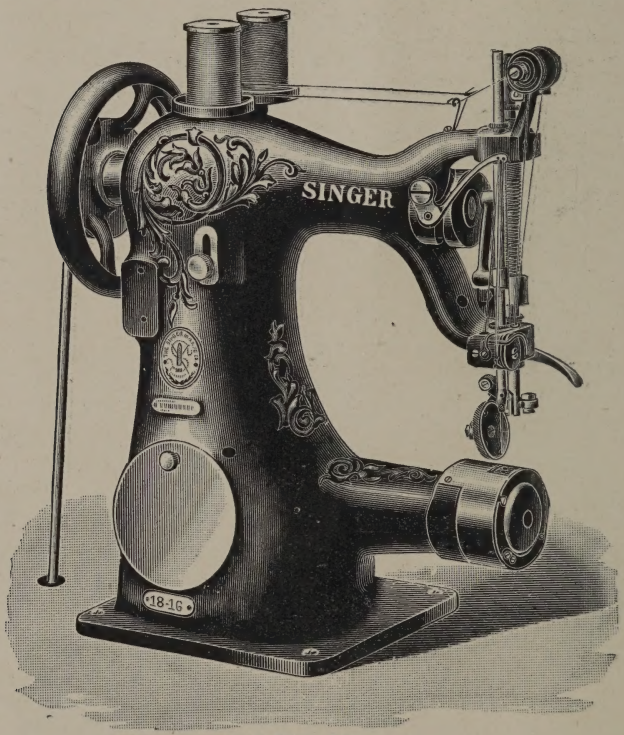

Fig. 16.

and short-arms. The one shown by Fig. 16 is known as the left-hand, short-arm, twin-needle.

Special care should be taken in selecting twin-needle machines, to have them suitable for the work to be done. That is, if the work will be light glace, then a machine with narrow-gauge needles will be most suitable; on the other hand, if the work is stout, then a wider gauge will be better.

Since the Singer Co. and the Wheeler and Wilson Co. have become practically one by amalgamation, there can be no reason why we should not show Fig. 17 in juxtaposition with Fig. 16; and, while I usually refrain from expressing an opinion as to the particular merits of any two machines—all have some very good points—yet I may say that, personally, I favour Fig. 17, for the

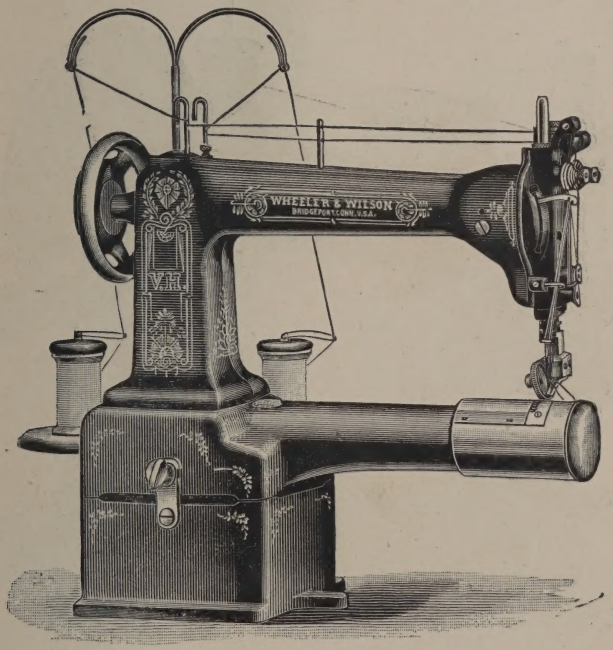

Fig. 17.

simple reason that the shuttles can be got at independently.

For very stout leather work, such as navvy's, Bluchers, stout shooting boots, and others which require stitching with "wax" thread (it is not always waxed!), Fig. 18 is an excellent machine. Very strongly built and solid, it will stitch through an extra stout substance with ease, and, being of the cylinder type, en-

ables the operator to get at the work easily, without creasing the upper.

The over-seaming, zigzag, half-chain, and fancy-stitch machines are mostly constructed on a uniform principle—that is, the needles are made to oscillate from side to side, and so form some particular design, while the work is moving in a straight line. The de-

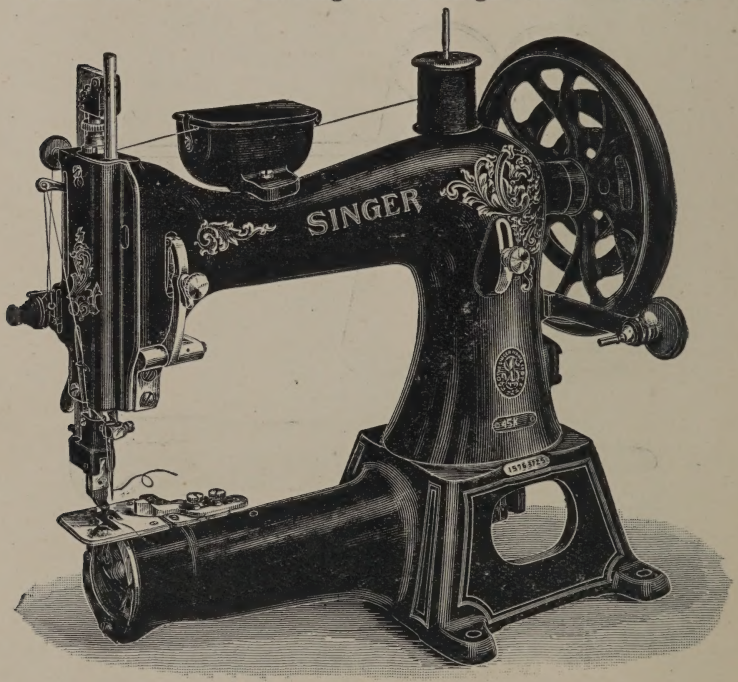

Fig. 18.

signs can be varied considerably by an adjustment of the screw which regulates the length of stitch, and what is technically known as the "throw." As the stitch is formed mechanically, it follows that no special skill is required on the part of the operator to produce the designs.

There are two or three varieties of the pillar and post machine on the market, one of which is shown by Fig.

19. These machines are built for special operations, such as the stitching of jockey-back straps, etc.

Machines for working lace-holes in silk are not used so much to-day as they were some few years since, as the introduction of unchangeable celluloid eyelets has done much to render their use unnecessary.

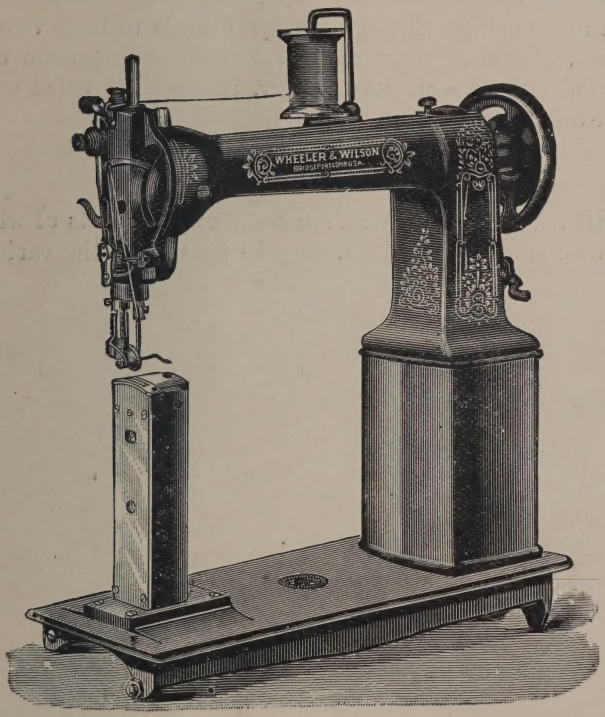

Fig. 19.

The Reece button-hole machine is so well known that a description or sketch of it is not necessary.

The "Reece" finishing machine is a very clever device for finishing off the button-holes neatly and firmly. It simply gathers up the loose ends from the holes, at the back of the button-piece, and over-sews them on to

the fly-lining, the needle working horizontally, instead of vertically.

The Singer Company also make a very good button-hole machine, which works an excellent hole, very much in appearance like the best hand-worked holes. The machine, however, is not equal to the Reece in point of speed by a long way. The most economical plan of working this type of machine is to have two of them, placed at right angles, so that one operator can attend to both—an easy matter, if she is provided with a revolving seat.

SKIVING MACHINES, ETC.

Having briefly considered some of the points of well-known sewing machines, we will pass on to the various

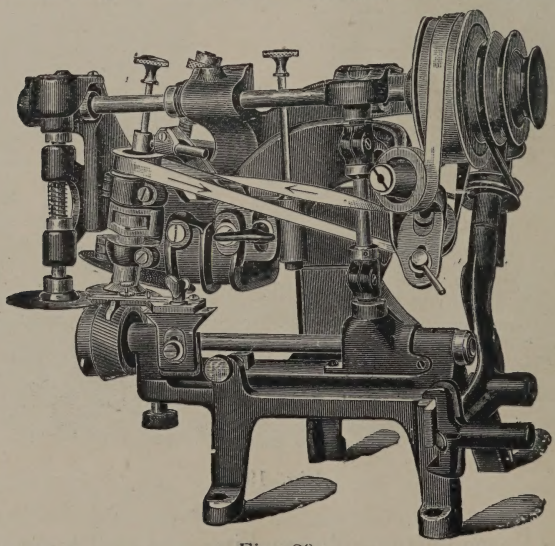

Fig. 20.

skiving and other special machines which are so essential for the preparation of materials where the modern methods of "holding together" are in vogue, or where the work of the fitter is reduced to a minimum.

The old-style "Amazeen" skiver was a very good machine, but the new friction-feed "Amazeen" (Fig. 20) is a decided improvement, and is much appreciated by all those who use it. It is admirably adapted for skiving light leathers, such as glace, etc., for turning-in, and (by using a saw knife) the stoutest of upper leathers can be skived, and a wide "scarf" produced for

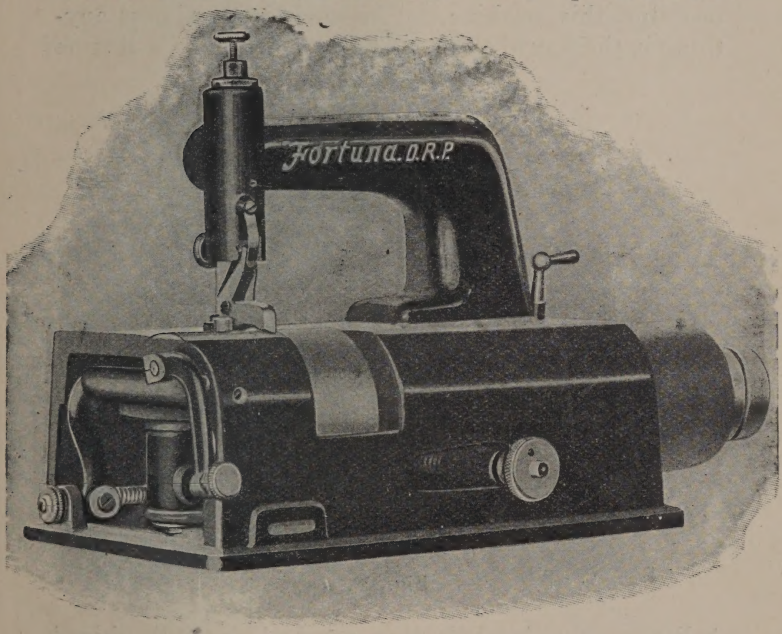

Fig. 21.

skiving the vamps (under toe-caps) for the benefit of the laster.

A very good and thoroughly well made machine is the "Carver" skiver. It has a fixed knife, and is well suited for men's heavy work, such as stout wax calf, kip, and split.

The "Fortuna" skiving machine (Fig. 21) differs considerably in style of construction from both the "Amazeen" and the "Carver." As is generally known, in

the case of the two former the leather to be skived is placed in the machine with the under side at the top—which expression is somewhat paradoxical—but the reverse is adopted with the "Fortuna," the material being placed face upwards, and instead of the work being "fed" from the operator it passes over the bed of the machine from left to right. In the hands of an expert operator, this machine can be made to do almost anything in the way of skiving. Stout "toe-puffs," cut from

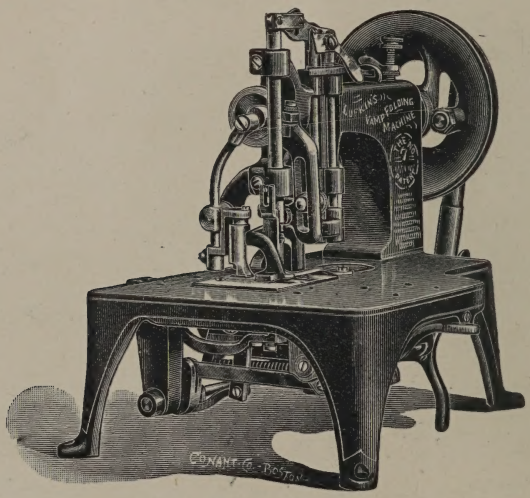

Fig. 22.

bellies or other insole leather, can be beautifully skived on the "Fortuna," the "scarf" being practically perfect, without that objectionable ridge which is sometimes present when stout leathers are skived. By making a few adjustments the machine will take glace kid and skive it for turning-in in a most satisfactory manner. It is, however, a good plan to have two machines, one adjusted for stout work, such as skiving "puffs," and the other for light material like glace kid. Inside facings and top-bands of ladies' work, which, owing to their narrowness, cannot be manipulated with safety on

some other machines, can be skived with ease by using a "Fortuna."

Perhaps the best-known folding machine in this country is the "Lufkin." Our illustration (Fig. 22) shows one of the improved type. This machine works very much on the same principle as the sewing machine, so that practically all curved edges can be folded with ease

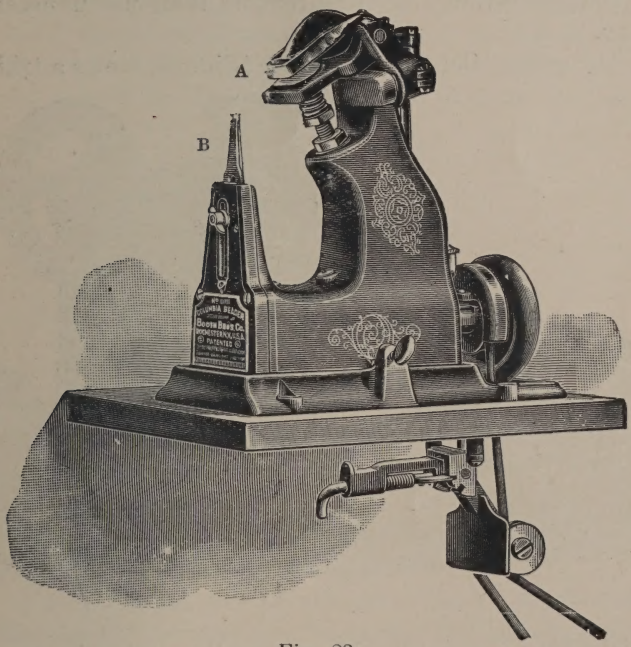

Fig. 23.

and rapidity. It should be stated that the edges to be folded are first smeared with rubber solution, which is allowed to dry before the work is put on the machine.

Two other folders, of comparatively recent introduction "on this side," are the "Booth" and the "Boston." Both are of a similar type (quite distinct from the "Lufkin"), the principle on which they work being the folding of a continuous line at one stroke. This is a very

speedy method, naturally, but it entails the use of special plates, or forms, to suit the parts which are to be folded.

The "Urquhart" beading machine is a very clever device for placing an inserted bead on a scalloped button-piece. There is, however, less call for these machines than formerly, because the prevailing fashion of bagged reversed scollops renders their use unnecessary.

The name "Columbia" beader (Fig. 23) seems a trifle

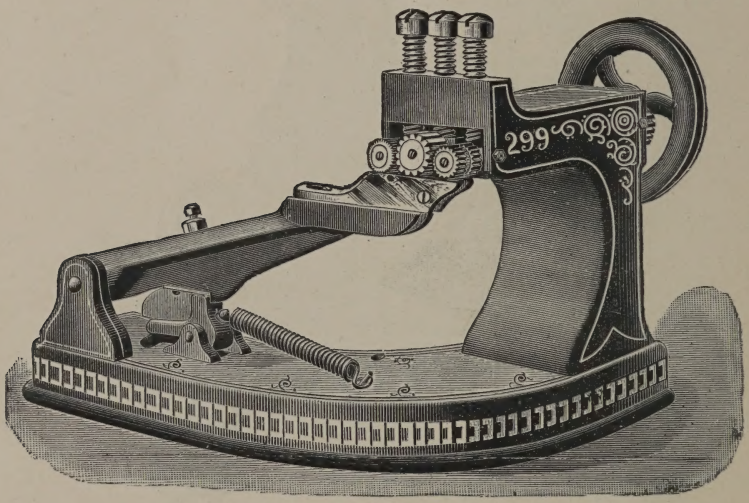

Fig. 24.

misleading, as we Britishers usually apply the term "bead" to something which is inserted, or to a lining, or inside facing and top-bands, which are turned in and allowed to project slightly beyond the edge of the quarters of a Bal. or shoe, and so form a "bead." The machine now being considered is really a bagging machine, and is admirably adapted for that purpose. The hammer (letter A) being out of the way of rubber (letter B), admits of the operator handling the work with ease, and gives a satisfactory result.

Fig. 24 is an illustration of the "Union" seam finisher, designed chiefly for the trimming of welts on back seams, etc. The machine rubs down the seam, trims off the welt and partly "sets" it at one operation, thereby effecting a considerable saving in time.

Machines for sewing on buttons are made in several styles. Those for use with shank buttons usually have a hopper, into which the buttons are placed, then a revolving brush arrangement starts them sliding down a chute, at the bottom of which they arrive exactly in the right position for the needle to attach them to the boot.

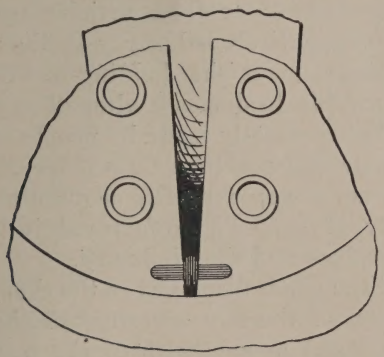

Fig. 25.

A very high rate of speed is obtained, amounting to sixty or more buttons per minute.

So great are the number and variety of machines used in the modern closing department that the task of merely mentioning them becomes wearisome to the writer, and lest it may have the same effect on the reader we will only refer to one more, the barring or tacking machine, and then proceed to other matters in connection with upper closing. There are several tacking machines in use. One of the operations they are intended to perform is shown at Fig. 25, which represents the bottom of the quarters of a Bal. with the "tack" or "bar" attached.

THE HOLDING-TOGETHER SYSTEM;

OR,

UPPER CLOSING WITHOUT THE AID OF FITTERS.

The "holding together" system, which is becoming more and more generally adopted, where practicable, has many good features which are well worthy of careful consideration. They are, chiefly, (1) getting rid of the paste, (2) suppleness of uppers when completed, and (3) economy. I would, however, warn the technical student (for whose study these articles are chiefly intended) not to be entirely led astray by the remarks one sometimes hears about the holding-together method making it possible to dispense altogether with fitters. Such remarks are usually made by people who have not a very intimate and practical knowledge of the closing department, nor a very extensive acquaintance with the great variety of goods manufactured in the various centres of the boot and shoe industry.

A study of the goods displayed in the shop windows, or an observation of the foot coverings of the people we meet in the street or ride with in the tram-cars, will reveal to the initiated the fact that some part of many of the boots worn has been through the hands of a fitter. It is nevertheless quite true that there are many types of boots and shoes that can be got through the closing department entirely without the aid of fitters. On the other hand, to dispense with fitters entirely would mean an alteration in the style of many existing patterns, and in a few cases certain leathers could not be used unless the "raw edge" or "trimmed off" method was followed, which would not enhance the appearance of the finished article.

It naturally follows, then, that the holding-together system must commence in the clicking room. The pattern-cutter must design his patterns to suit the method, or it cannot be adopted.

I am ready to admit that we have certainly learnt something from our American competitors as regards the design and closing of uppers without paste, although a considerable amount of holding together was practised on certain types of boots in this country long before the "Yankee invasion." I may state further that a study of American uppers leads to the conclusion that one of the chief objects aimed at by their designers seems to be to so cut their work that it may give as little trouble as possible in the closing department. When our designers strive after the same object, there may be happy times in store for closing-room superintendents.

I do not, however, wish to write disparagingly of designers; they are certainly a body of men of whom any trade might be proud. Thoughtful, studious, painstaking, and intelligent, they are often artists in the truest sense of the word, and their fancy patterns, which often cause much trouble to fitters and machinists, are generally the outcome of striving after novelty. But I must really come to close quarters with my subject.

We will first, then, consider a ladies' glace Bal.—a vamp and quarter boot—cut with a straight top. Such a boot is well suited to the holding-together system.

After the work is received from the clicking department, it should be carefully counted before the bundles are untied, to see if the numbers of all parts are correct. If there is anything missing—say a vamp or quarter—the bundle should at once be returned to the clicking room intact. This may save much time, and is certainly more fair to the clicker than if the work is commenced, and then a message sent to the effect that there is some part deficient.

The first operation may be to join the linings up the back seam, or it may be to stitch the inside facings to the lining, leaving the back seam for the next operation. This depends chiefly on the way the bands and facings are cut; if the facings are cut to go over the ends of the top bands, then the back seam of lining

must be closed up first; if, on the other hand, the bands reach to the edge of the quarters, and the facings are cut short of the top of the boot, then the other method may be used.

We will imagine that the boot we are considering is cut with facings long enough to come over the band—we will say a ribbon band, in which case the facings usually reach to the top; then the first operation would be to close the linings and tape them on a two-needle tapeing machine, or join them on the special machine, which turns one lining over the other, and so does away with the necessity for tape. The linings are now ready for the top-bands and facings.

The quarters and vamps would go to be skived on the "Amazeen" (Fig. 20) or the "Fortuna" (Fig. 21). They would be skived up the front—from the vamp position to the top of leg—rather thin, and with a fairly wide "scarf" suitable for turning in. The top of the quarters should also be skived in a similar manner, so that the tops would turn down or "bag over" easily.

Quite a recent addition to the list of skiving machines is the "Marvel." I cannot say, at the time of writing, that I have had any practical experience of this machine, but hope to very soon.

Now, if the fronts of quarters are to be turned in on the "Lufkin" folder (Fig. 22), it will be necessary to smear the edges with rubber solution, which must be left to dry for a short time after being put on, as the fold will not stick down if the solution is too wet.

It is best to lay the quarters on a table—covered with stout brown paper—in the manner shown by Fig. 26. By this plan a considerable number of the edges can be smeared with a few strokes of the brush. After the edges have been folded, the outside facing rows may be stitched, and the back seam of quarters closed. All the rubbing that will be necessary for the seam of a light material like glace kid may be performed by the "Rapid" seam-rubbing machine.

The quarters are now ready to be "silked"—i.e., a row of stitching put each side of the closing seam; this is usually performed by a twin-needle machine, which inserts the tape which strengthens the seam (that is, if it does strengthen it; I am not quite sure about it, but certainly it looks stronger to the purchaser. which point has to be considered).

As before stated, it is necessary for the success of the holding-together system that the parts should be specially prepared in the clicking room; therefore, the linings will have been "pricked" or "holed" by the

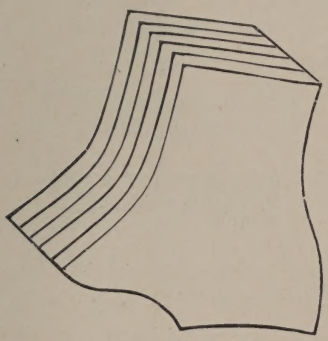

FIG 26.

clicker, so as to show the exact position for the inside facings and top bands. The operator will simply lay the top-bands to the holes and run them on, either by the fancy stitch, zigzag, or plain machine, following with the facings.

There is a machine with a device specially adapted for silk or fabric bands cut from pieced silk—where there would, of course, be no selvedge—which arrangement is something after the style of a "hemmer" on a domestic machine. This turns in the bottom of the band while it is being stitched.

We now get the quarters as shown by A A and the linings B B Fig. 27. They are then placed with the right side of the quarters facing the right side of the

linings, and machined together along the line C, after which they may be "bagged" or turned over by running them through the bagging machine (Fig. 23).

Now they are in proper position and ready for the machinist to stitch round the quarters—that is, up the front of one, along the top of both, and down the front of the other. This is best done on a diagonal trimming machine (Fig. 12), so that the margin on the inside facing is trimmed off at the one operation. The under-

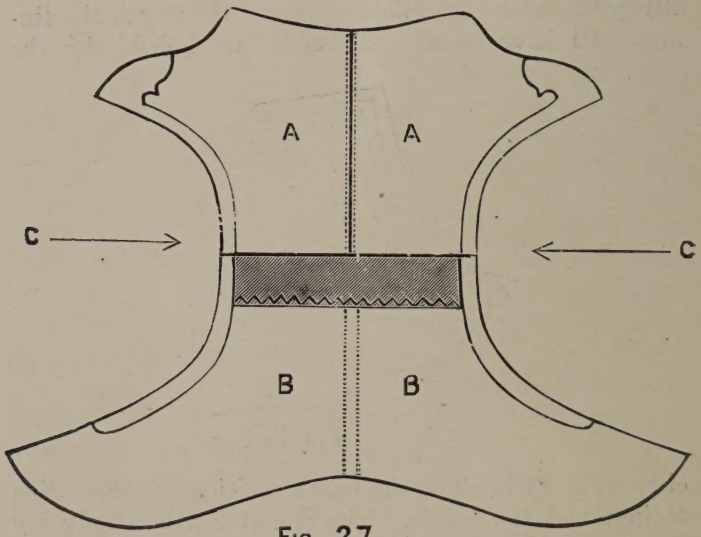

Fig 27.

trimmer (sometimes called the "Barbour" trimmer) is also well adapted for this purpose. The linings can now be joined down the toe, and the uppers are ready to have the eyelets inserted.

If the linings are to be left loose from the vamps, two slight cuts will be necessary at the bottom of the facings to allow the linings to be turned back while the vamps are being stitched. The machinist now takes the vamps, places them to the prick marks, and machines them on, either with a two-needle or single-needle machine, as the case may be. A cylinder

machine is best for this operation. It only remains for the tongue to be stitched in and the quarters "stayed" above the vamp (see Fig. 25), on the tacking-over machine, and the upper is completed, all the operations having been done without the aid of a fitter or the use of paste.

It may perhaps be well to consider two methods of closing a lady's button boot—one style entirely without fitting, and the other with a very small portion of fitting, scarcely worth consideration.

Taking the first method, the linings would be closed, the top-bands machined on, and the button-fly lining machined to the linen lining. The form now resem-

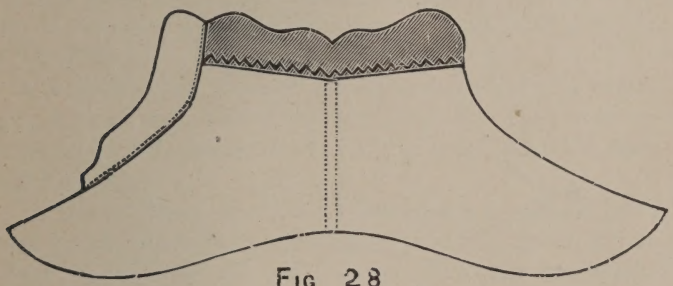

Fig 28

bles Fig. 28. Next the quarters would be closed down the back, and the button-fly closed on and stitched; then we get something like Fig. 29. Now the right side of the quarters are placed to face the right side of the lining and machined right round, from A to C (Fig. 29). It will be noticed that the fly lining on Fig. 28 has a straight edge, and the button piece (Fig. 29) is pointed, so that the stitching should be done on a trimming machine, that the fly lining may be trimmed to shape at the one operation. The boot is now turned inside out entirely, and (after being put through the bagging machine) machined round again from A to C, after which the buttonholes are worked. It is then ready for the buttons, which may be sewed on by ma-

chine. The operator would next close the lining at toe—some linings are not closed, simply left unstitched, and the laster laps them one over the other—then stitch on the vamps, and the uppers are complete, less the tacking or staying.

The most simple design for a button boot which has to be "held together" is one with a straight button-piece. This style is not only easy to manipulate, but looks well when done.

Another plan is to "make" the button piece first —i.e., attach button bits to B.B. linings, turn out, or "bag"—machine round edge, then work button-holes

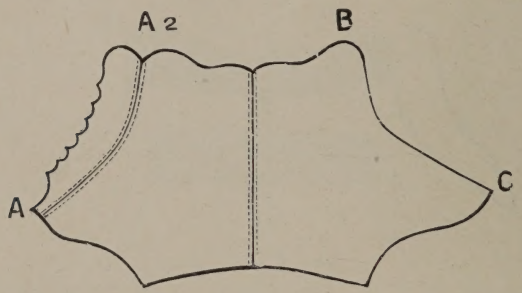

FIG 29.

before the button flies are attached to quarters. (This method also suits a turned-in button piece, or one with a scalloped edge, and inserted bead.)

If the quarters have already been seamed, and the linings prepared, the button bits are now joined to the quarters, the quarters and linings laid face to face, and attached as before described, except that the machining would commence at A 2 and cease at B (Fig. 29). They are then turned out and stitched round again, but there remains a bit of fitting to be done, viz., to turn in the linen lining from B to C. The subsequent operations to complete are as described on former type of button boot.

A lady's Oxford shoe with bagged quarters is one of

the most simple designs to manipulate in the closing room. If it is cut with round corners on the instep, and intended to be bagged or turned out with the two top edges (quarters and linings) level, then, after the backs are joined, the quarters and linings are simply laid face to face, stitched round on a vertical trimming machine, and turned out, then stitched round again, and the shoe is ready for vamp lining and vamp.

If the shoe is to be deeply bagged—that is, a small strip of the quarter pulled over so as to show on the inside, then it is more easy to do if cut with a square corner at the top of the quarter, in which case it would be turned in on the folding machine up the front, and bagged along the top. This design makes a smart-looking shoe—say, with a black glace quarter and a white lamb lining.

A round-corner Oxford, to be bagged deeply, needs very special and careful cutting, and is rather troublesome to do, but can be done, with care, if cut from very light leather.

As the outlines of the holding-together system have been briefly sketched in the types of ladies' goods given above, it will perhaps suffice if we give only one specimen of men's—viz., a glace Bal. with turned-in golosh and jockey-back strap, as shown by Fig. 30. The quarters of this boot would be turned in up the front and bagged over at top, so that the operations of skiving and turning in are similar to those of the lady's glace Bal. (Fig. 27). The facings and top-bands are also stitched on to the lining in a similar manner. For a goloshed boot that has to be done entirely without fitting it is best to close down the back seam of the lining only so far as the top of the stiffener, leaving the piece which comes under the golosh not joined, and the inside strap quite loose, the same distance. This allows the laster an opportunity to get out any little fulness of the lining by lapping one piece over the other.

The quarters are closed on to the linings—face to

face—exactly the same as in the woman's Bal. described above. After turning out and stitching, the eyelets may be inserted, and the boot is ready for goloshing. Before doing this, however, it is a good plan to stitch a row along the extreme edge, at the bottom of the quarters, so as to prevent the lining being pleated during the operation of holding on and stitching the golosh. It is absolutely necessary that the golosh should be cut so as to fit correctly—it must not be too loose or too

Fig. 30.

tight—for the success of this method. The operator now takes the golosh and places it to the prick-holes in the front, being very careful to see that the back strap (jockey outside) is exactly in the centre of the seam. It is best to start stitching somewhere about point A, so that the front of the golosh is secured in position first. The first row round having now been stitched, the trouble is practically over.

It will be seen from the foregoing that it is comparatively easy to do this type of boot without fitting and without paste; the only operation which is somewhat

difficult—but which can be done with care—is the holding on of the golosh.

The examples of the holding-together method already given really cover the basis of practically the whole system, the details varying slightly according to the design of uppers. For instance, a gent.'s glace Derby Bal. would be done in the same way as the golosh boot, up to a certain point; then the putting-in of the tongue and stitching the sides would take the place of machining the golosh.

There are several styles of men's common grade of boots, such as split Derbys, split vamp-and-quarter Bals., navvies, Bluchers, etc., which it has been customary for many years to hold together, and as the methods are simple and generally well known, it is scarcely necessary to go into details.

I might say, however, that a man's split Derby (commonly made up with nailed bottoms and retailed at prices varying from about 5s. to 9s. per pair), if intended to be trimmed off (raw edge) facings, would have the facings held on and stitched by a vertical trimmer, then the back seams welted. Now the sections which form the counters must be joined, so as to make the counter complete, when it may be stitched on to the quarters from the inside. This does away with the necessity for marking the counter row (for the guidance of the machinist), and, the stitching being on the edge, there is no margin needing to be trimmed off, as would be the case if the counter were stitched from the outside. This is also an economical method, as three operations are saved.

The tongue is next stitched to the vamp. There are several ways of doing this, which depend much on the way the tongue is cut. It may be placed (1) under the vamp and over the top of the vamp lining, or (2) between the vamp and vamp lining, or (3) on the top of the vamp. Again, it may be a blocked tongue, or a "sprung-on" tongue, i.e., cut with a "draft," so that

when the two sides are placed to the prick marks the draft causes the tongue to "stand up" similar to a blocked tongue. This operation having been performed, one side of the tongue is caught up with the facing row, then the side (A, Fig. 31) is stitched, after which the other facing and side are done in like manner.

I mentioned at the commencement of these articles that there were some types of boots and shoes and some special operations which require to be done by a fitter. As, however, many of these have already been described by other writers in various books on boot and shoe technology, it might not serve any useful purpose to again

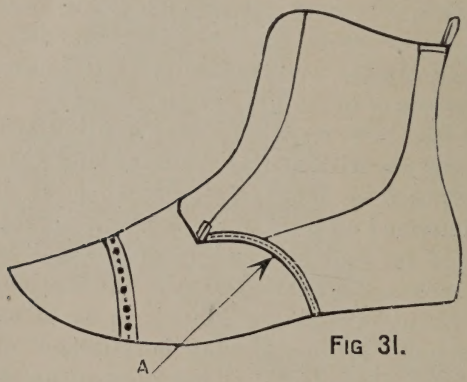

FIG 31.

travel over the same ground. I shall, therefore, simply state a few of the items, and then pass on to other matters connected with upper closing.

Amongst many other operations where the services of fitters are needed are: Ladies' button boots, with underlaid vamps; many of the fancy designs in bar-shoes; men's and women's Bals., with turned-in linings or turned-in bands and facings; Bals. or shoes with "pulled-over" or "narrow" binding; children's ankle-straps, narrow bound; men's and women's elastic-side boots, etc. With reference to the last item, I am not overlooking the fact that there is a gusset fitting machine (made by a Leicester firm of engineers) which is

used for the fitting of Chelseas, and also a large machine —of French make. if memory is correct—which is a very clever invention for the fitting of springs, and is admirably adapted for Cashmere work. The machine has a large iron base in the form of a flat table, on which brass plates are hinged, the plates being in the form of a lining pattern.

There are four levers, worked by the foot, each of which raises an oblong iron block, which is heated by gas. These blocks are the exact size the elastic is to be when finished. A steel slide is inserted, and the blocks, which are made to move slightly forward, press over the Cashmere (or leather, as the case may be) so that the edge is turned in, or "beaded," at a single operation.

The elastic (the edges of which have been smeared with dextrine by a special device for that purpose) is next laid in position. Then another lever is used, and the lining turned over. The next operation is to bring one plate over the other in exactly the same manner that one would close up a book.

One side of the upper having thus been fitted, the other side is done the same, after which they are taken out and put under a press and allowed to dry.

NEEDLES.

Although the average sewing machine needle is so small that it might be looked upon as insignificant and scarcely worth consideration, still it plays a most important part in the closing of uppers.

There is no true economy in buying needles which are low in price, and consequently low in quality. If we consider for a moment the severe strain which is put on a needle in having to pierce close-grained and fairly stout leather such as the better qualities of Box calf, and that the incisions have to be made at the rate of several hundred per minute, it will be obvious that the needle

must be made of good material and well finished, or the breakages will be many.

A needle with the slightest roughness at the eye should at once be discarded, as the silk would be frayed and the strength reduced to a minimum.

One firm has recently introduced a nickel-plated needle, which is said to work well, as the nickel acts in some manner like a lubricant. To give a clear description of the various types and sizes of needles is rather difficult without entering into a long definition, as each manufacturer seems to adopt a size and trade description of his own, so that to merely state the names would be of little use. To those who wish to pursue the subject further, I would recommend them to read the remarks of Mr. F. Y. Golding, in "The Manufacture of Boots and Shoes," wherein he devotes considerable space to needles.

STITCHING MATERIALS: SILKS, THREADS, COTTONS.

I have no intention, in the few thoughts I may here put down with reference to stitching materials, to again open up the discussion which some years since raged round the subject of silk versus cotton. The matter was fairly well thrashed out at the time, and, in spite of all that was then said and written for and against both materials, we still use them to-day, as no substitute has yet been found to take their place. No hard-and-fast rule can be laid down as to which is the best material to use for certain stitching operations if we are to consider the three primary points—cost, appearance, strength.

So very much depends on the class of upper to be stitched that what would be suitable for one would be altogether unsuitable for another. For instance, a ladies' super. quality glace vamp, stiched with one row only of fine silk, may remain intact without one stitch giving way, until the shoe is completely worn out. On the other hand, a man's golosh, stitched with twist of a

stout size and good quality, with two or more rows of stitching, may, under certain conditions, break in one place after a few weeks' wear. Again, a man's common split Bal., the golosh of which has been stitched with a cheap thread, may remain firm and solid after many months of hard wear.

As silk is a fairly expensive article, there are naturally many substitutes manufactured, some of which are known as "mercerised cotton," "Sylko," "Silk Lustre," "Silk Substitute," and so on, in addition to which there are a variety of cotton threads, linen threads, etc, made by many firms, all of which are very good for special operations, and under certain conditions.

It is generally well known to those engaged in the boot and shoe industry that the town of Leek, in Staffordshire, is the principal seat of the sewing silk trade. A few brief remarks as to the methods employed in the manufacture of silk may, perhaps, be of some interest to readers of these articles.

Raw silk is imported from Italy, China, Japan, and India. The best silk for the making of boot silks comes from China. The raw material arrives in this country in what are called bales, each bale containing twelve books, or small bundles, which consist of so many hanks, wound off from innumerable cocoons. A bale weighs, on an average, about one hundred pounds, and a book from eight to nine pounds.

The market value of raw silk is ruled by (1) the crop, or production, (2) consumption, (3) speculation. The best silk, commonly called nett silk, is made from the raw fibres, which are a product of the silk-worm. Spun silk is made from the "waste," which is gathered from the manufacture of the best, or nett silk, and is consequently an inferior article, being composed of short pieces wound together, and naturally will not stand so great a strain. The strongest and best silk for boot closing is that which is dyed on the gum; that is to say, the gum which is contained in the silk is not boiled off.

This is frequently called closing silk. The boiling out of the gum weakens the silk but increases the lustre, which appearance may be necessary for some purposes, but is not of so much importance on a boot, there generally being quite as much lustre as is needed on the better qualities of black or yellow closing silks.

When the raw silk arrives at the mills the first operation is to wind off the silk by the single thread from the hanks. It is then passed between two knives, which clear the threads of all roughness. These fragments, together with other odds and ends, are carefully gathered up and used for the manufacture of spun silk. The next process is called "throwing." By this several of the fine silk threads are thrown together—that is, wound off the various reels—and passed together through one eye. Next they are twisted, then once more several of these threads are thrown together, and again twisted and wound into hanks. If the gum is to be extracted, these hanks are tied up in coarse canvas bags and put into a copper to be boiled for several hours. After being taken out and dried they are ready for the dyer. The hanks of silk are suspended from short poles over the vats containing the dye, and are frequently moved about, so that every particle of the material comes in contact with the dye. After being removed from the dye it is dashed through cold water, and then taken again to the drying-house.

With regard to spun silk, after the waste has been boiled to extract the gum it is spread out and combed by machinery. Then, after several other processes, it comes to the throwing and twisting machines, which put several threads together; after which, to make it sufficiently smooth, it is "gassed"—that is, the gassing machine passes it through the flame from a gas-pipe, which effectually clears off all the fluff.

MANAGEMENT OF THE CLOSING DEPARTMENT.

"Imagine one man having to look after all these women!" was a remark made by one of a party of visitors who were inspecting a large upper closing department. Doubtless the task seemed to the speaker a gigantic one, and almost impossible of accomplishment with any degree of success.

And, truly, the work is by no means easy, but the difficulties are not so much caused by matters which were perhaps only vaguely defined in the mind of the person who made the remark, but from entirely different causes. It does not necessarily follow that 150 or 200 women and girls are more difficult to manage in a workroom than a like number of men and boys, as far as discipline is concerned; but one of the greatest difficulties is to get females to look upon work in a serious manner. They are usually inclined to be somewhat frivolous—excited at the most trivial thing that may occur out of the ordinary routine; talkative, full of "novels" and gossip, and generally looking forward with much eagerness—which is quite natural—to that day when someone shall lead them to the altar and—happiness!

I have some recollection of once seeing a printed description of what an ideal closing room manager should be like, but, although this is some years since, it is possible he is not yet born!

It is not an easy task to give hints as to how to manage a closing room successfully, because so much depends on circumstances, such as the class of work to be done, the system employed, and the results expected. It is obvious that arrangements which would suit, say, a Kingswood house would scarcely be the best possible methods for some Stafford firms (to mention two extremes), as the class of goods produced are so entirely different.

Whatever system is in vogue—piece-work, day-work, team system, holding-together style, or a combination of these—it is always wise to have all work counted as it arrives from the clicking room before the bundles are untied, and any that are wrong should be returned to be corrected. This may save much annoyance and some delay.

Personally, I am in favour of having a complete set of books and a thorough system of keeping them, so that orders can be traced when necessary. To try and "muddle through" without books is a mistaken policy.

As the work arrives in the department it should be all entered in a book, the number of the boot, the quantity and sizes, and the date received. If there are fitters employed, and the work is first given to them to commence, the fitter's number should appear in the book, so that the work can be traced. The ticket should also bear the fitter's number, which number she will mark on all sections of her work. This method must be followed by the machinist.

It is obvious that practically all the hands must have numbers allotted to them, which numbers may very well commence at No. 20, so that there will be no confusion with the sizes marked on the linings and other sections.

When the work is finished and ready to leave for the next department, it should be ticked off in the work-received book, and, if practicable, the date entered, so that it can be seen at a glance how long the work was in the room.

A description book, giving all details connected with the department, is absolutely necessary to avoid mistakes in closing. In many cases it is well to give a rough sketch to supplement the written matter, such as the following:

> No. 3,000.—Ladies' Tan Glace Oxford, circular golosh, straight cap, quarters deep bagged; goloshes, vamps, and caps, punched and turned in.

If the room is run on the piece-work system, a book

will also be necessary giving the price for all separate operations of fitting and machining. A special book is necessary for the entering of all bespoke work, and as time is such an important item with these, it is well to state the hour (in addition to the day) when received and when finished, so that, should an irate customer complain of not receiving his specials in time, a glance at the book will show how long they were in the department, and if the time occupied was only reasonable; then the closing room will be free from blame in the matter.

A simple method of keeping the account of each of

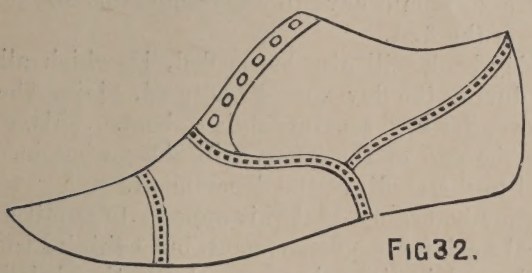

FIG 32.

those machinists who are on piece-work is to have a book, which may be ruled with columns for each item. To give a few will serve as an illustration:

Toecaps.	Vamps.	Quarters.	Facings.
1doz.	2doz.	6prs.	4doz.
1doz.		18prs.	

each separate item being entered as the work is done and continued in line down the columns, which would be added up by the clerk at the end of the week, when amount of money earned will be ascertained.

It is a good plan to enter all silks, threads, and cottons as given out to the machinists, stating the names (or numbers) of the operators to whom they are given, entering each reel separately, and insisting on the empty reels being returned to the desk before new full ones are supplied. By this means it is easy to ascertain how much stitching material is being used weekly.

It is scarcely necessary to point out that there must be a book giving a list of the complete prices allowed to the department for all finished work. Such book would only be accessible to the clerk and those in authority.

No definite statement can be given as to how these prices are to be fixed, because so much depends on what the price is to cover. That is, it may only have to cover what may be called the productive labour, viz., the wages of fitters, machinists, eyeletters, etc., or it may have to include, in addition to these items, the cost of silks and threads, managing expenses, and an allowance for wear and tear. It is obvious that the prices on this latter basis would have to be considerably higher than those on the first.

A day-book will also be needed, in which all work done during the day must be entered, giving the price per dozen for each separate style of boot. This, totalled up at the end of the week, will show what has to be placed to the credit of the department.

It may be argued that this appears to entail a lot of clerical work for one department, but I think I can show that the end justifies the means by stating briefly that one can tell at a glance whether or no the financial result of the working is satisfactory.

Supposed that the amount earned by the department (based on the prices allowed for finished work) equals X, the wages paid equals P, and material (silk and thread) used equals M, then, if P+M=X, the account, of course, exactly balances, and there has been neither loss nor gain. But if X exceeds P+M, then we have made a profit. On the other hand, if P+M are greater than X, then there has been a loss on the working.

Closing departments are arranged on various plans, and some apparently without any definite plan. The best arranged are supposed to be those where the work enters at one end, passes along the room as the various stages are reached, until the finished uppers arrive at the other end. To enable this to be done, the machines

must be placed according to the order of the work, commencing with the skiving machines, and following with the machines suitable for each operation as the work journeys along.

It is scarcely possible to give a plan, because, as I have before mentioned in these articles, the class of goods produced varies so much at different factories that what would be well suited for some might be altogether unsuited for others.

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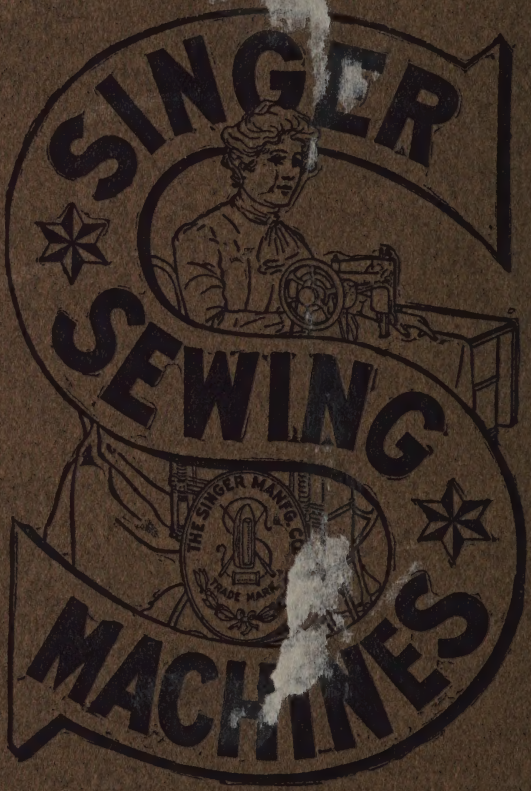

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